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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,431	02/24/2005	Steffen Gutmann	450100-04737	3935

7590 09/04/2008

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EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
09/04/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,431	GUTMANN ET AL.	
	Examiner	Art Unit	
	CHRISTINE M. BEHNCKE	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/24/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the application filed 24 February 2005, in which claims 1-26 were presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8, 11-23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly, US 5,999,866, in view of Chotiros, US 4,891,762.

(Claims 1, 2, 17, 18, 25 and 26) Kelly describes a robot and/or a mobile body apparatus, method and program adapted to move in an environment containing one or more landmarks located therein, the robot apparatus comprising: environment map building means for building an identifiable unique environment map by means of the location or the number of one or more landmarks according to the result of observation of the one or more landmarks and the movement or state quantity of the robot apparatus (figure 4, column 6, lines 38-50 and column 7, lines 21-27); environmental map storage means for storing environmental maps as registered environment maps (map storage 34); identifying the current position of the robot by comparing the registered environment map and the current environment map built by the environment map building means (column 5, lines 16-37). Kelly does not describe wherein a plurality of maps are stored in the storage means or compared to the current map. However, Chotiros teaches an apparatus for identifying and recognizing spatial patterns in a plurality of maps, a current map being identified by sensed geometrical figures (column 4, lines 27-41, column 5, lines 42-49); the autonomous vehicle compares the sensed scene/map to a plurality of recognized maps (column 8, lines 53-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of Kelly with the teachings of Chotiros because as Chotiros suggests, while

more costly in processing, comparing features to a plurality of maps is well known and dependent on the processing power of the available processors.

(Claims 4, 19) Chotiros further teaches wherein the environment maps contain positional information on the landmarks and the environment map storage means stores environment identifying information for identifying the environments along with the environment maps (column 4, lines 50-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kelly in view of the teachings of Chotiros because storing the position information of the features allows the system to determine the relative position and orientation of the vehicle and assists in detecting the environment.

(Claim 3) Kelly further describes wherein the registered environment maps are environment maps built by the environment map building means (column 7, lines 21-27).

(Claims 5 and 20) Kelly further describes wherein the environment identifying means computes the degree of similarity of the current environment map and each of the registered environment maps and identifies the current environment on the basis of the degrees of similarity (column 8, lines 56-64; column 12, lines 37-65).

(Claims 6 and 21) Kelly further describes wherein, when the degree of similarity between the current environment map and one of the registered environment maps is greater than a predetermined threshold value (column 10, lines 49-59), the environment identifying mean identifies the current environment as the environment shown on the

registered environment map and outputs the environment identifying information of the registered environment map (column 11, lines 12-35).

(Claims 7 and 22) Kelly further describes wherein the environment identifying means has an adding means for adding the current environment map to the environment map storage means when the degree of similarity between the current environment map and each and every one of the registered environment maps is smaller than a predetermined threshold value (column 9, lines 33-48).

(Claims 8 and 23) Kelly further describes exploring means for exploring the inside of the identifiable unique environment (column 11, lines 36-54).

(Claim 11) Kelly does not specify a predetermined number of landmarks. However, Chotiros teaches that to avoid a false alarm in the recognition the system uses a predetermined number of landmarks to identify the environment (column 7, lines 35-47).

(Claim 12) Kelly further describes wherein the one or more than one landmarks are uniquely identifiable in the identifiable unique environment (column 8, lines 22-55).

(Claims 13 and 14) Kelly does not describe wherein the landmarks are formed by combing a plurality of geometrical patterns. However, Chotiros teaches wherein the landmark or each of the more than one landmarks is formed by combing a plurality of geometrical patterns having different profiles and/or different colors (column 4, line 62-column 5, line 20). Chotiros further teaches wherein the environment map contains information on the direction of the landmark or each of the more than one landmarks along with information on the position of the landmark or each of the more than one

landmarks (column 4, lines 50-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kelly with the teachings of Chotiros because as Chotiros suggests using the known positions of the landmarks allows the system to determine the position and orientation of the vehicle and using the geometrical pattern is a known means of identifying features with less detailed sensors such as sonar and radar (column 1, lines 48-60).

(Claim 15) Kelly further describes wherein the movement/state quantity of the mobile body indicates the postural direction and the position of the mobile body (column 3, lines 42-56).

(Claim 16) Kelly further describes wherein the mobile body is an autonomous type robot apparatus that behaves according to the input information supplied to it (column 4, line 41-column 5, line 3).

Claim Rejections - 35 USC § 103

Claims 9, 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly in view of Chotiros as applied to claims 8 and 23 above, and further in view of Abramson, US 22007/0100500.

Neither Kelly or Chotiros specifically describe wherein the vehicle explores the area for a predetermined time. However, Abramson teaches an autonomous robot that is mapping an unknown environment, scanning for obstacles and open areas, including an exploring means for exploring the inside of an identifiable unique environment, end of exploration control means for controlling the exploring means so as to end the exploration in the inside of the environment ([0139]); wherein the end of exploration

control means ends the exploration of the exploring means when a predetermined number of landmarks are observed in the identifiable unique environment, when a predetermined period of time has elapsed since the start of exploration or when an instruction is given by the user who controls the mobile body so as to end the exploration in the environment ([0139]-[0140]). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the description of Kelly in view of Chotiros with the teachings of Abramson because as Abramson suggests scanning the environment for a predetermined time or distance allows the robot to accurately scan the environment for sought-for features quickly and avoids unnecessary processing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE M. BEHNCKE whose telephone number is (571)272-8103. The examiner can normally be reached on 8:30 am- 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. B./
Examiner, Art Unit 3661

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661